BENCKISER

Our Ref: 11053P1 WO/JCM.lm

Date: 16 July 2004

BY FACSIMILE & POST

The International Preliminary Examining Authority
THE EUROPEAN PATENT OFFICE
Erhardtstrasse 27
D 80331 Munich
Germany

Dear Sirs

International Patent Application No. PCT/GB03/02801
RECKITT BENCKISER (UK) LIMITED et al

I write in response to the Written Opinion issued in respect of the above-noted application on 19 March 2004. The Examiner is thanked for granting a one month extension to reply to the Written Opinion.

I enclose replacement description page 2 to replace description page 2 currently on file. I also enclose replacement claims pages 12 and 13 to replace claims pages 12 and 13 currently on file. For ease of reference, copies of these pages showing the proposed amendments in manuscript are also enclosed.

Dealing first with the observations contained in paragraph 4 of the Written Opinion, page 2 of the description has been amended to make clear that other aspects of the present invention are defined in the attached claims of the application. In addition, the ordering of claims 3 to 6 currently on file has been amended together with consequential amendments to their dependencies to clarify the nature of the resistive material in response to the objection in paragraph 4.2 of the Written Opinion. Finally, the objection in paragraph 4.3 to the lack of reference signs in the claims is noted. However, the applicant prefers to delay inserting reference numerals in the claims since they intend to proceed with this International application before National offices where this is not a requirement.

In paragraph 2 of the Written Opinion the Examiner has objected to the novelty of claim 1 based on documents D1, D2 and D3. In paragraph 2.2 the Examiner contends that document D1 discloses all of the features of the current claim 1 in particular the use of a flexible thin film heater. The Examiner appears to be equating the provision of a flexible thin film heater with the disclosure that an organic PTC material may be used as disclosed at column 2 line 50 to column 3 line 14 of document D1. The Examiner is incorrect in his

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understanding of the extent of the disclosure of document D1. The referenced passage from document D1 merely states that the heating means used in the transpirator may be formed from an organic PTC compound, it may consist of a mixture of a thermo plastic polyolefin resin and carbon and it may come in a wide variety of shapes. However, there is no disclosure in this document that the heater may be a flexible thin film heater. It is an incorrect assumption of the Examiner's that all PTC materials are flexible and thin. In any case, the PTC is not the entire heating means but only the resistive element of the heater. The heater of document D1 is shown in figures 3 and 4 and comprises not only the PTC material itself but also an insulator 11 and a copper electrode plate 10 as described at column 4 lines 63 to 67. Again, there is no disclosure that the heater in its entirety is flexible or thin. Indeed the provision of the copper plate 10 in the heater would suggest to the skilled reader that the heater was not flexible.

It is therefore submitted that claim 1 is novel over document D1. It is further submitted that claim 1 is inventive over document D1. Document D1 as noted above makes no disclosure that the heater of the transpirator could be made in a flexible form or in a thin form. There is no motivation to amend the construction of the heater such that it would meet the requirements of claim 1. In particular, it is clear from reading D1 that it is an essential requirement of the heater envisaged by the patentee that it include a copper plate electrode. Therefore, to form a flexible thin film heater would involve substantial structural changes to the arrangement shown in D1 and there is no motivation for the skilled reader to make these changes as there is no advantage for the heater to be flexible in the arrangement shown in D1.

In paragraph 2.2 of the Written Opinion the Examiner has also objected to the novelty of claim 1 based on document D2. The Examiner contends that D2 discloses all of the features of claim 1 and in particular that it discloses a heating means which is a flexible thin film heater because of the disclosure of an electric resistance foil on page 2 lines 21 to 24 of D2. The applicant disagrees with the Examiner's contention. The passage referenced by the Examiner reads "the heating device may comprise an electric resistance foil located in the fragrance carrier, resistance wires whether or not on a ceramic base, or an etched or printed resistance circuit controlled by a printed circuit board, the resistance circuit passing through individual fragrance carriers". It should be realised that the heating device of document D2 as disclosed does not only comprise an electric resistance foil or resistance wires or an etched or printed resistance circuit. Two embodiments of heating device are shown in Figures 8 and 9 and 10 and 11 respectively as indicated on page 6 lines 29 to 30. The Examiner's attention is specifically drawn to page 7 lines 1 to 7 where it is stated that "the heating element shown in Figure 8 is a sinusoidal wire heater element 42 embedded in a substrate 43. The enlarged drawing of the cross-section through the substrate and element shows that the heater is in intimate contact with the fragrance gel 44. In the second embodiment of the heater shown in Figures 10 and 11 the heater is a printed conductor 45 in intimate contact with the fragranced gel 45".

It can be noted from this passage and examination of Figures 8 to 11 that the heating element disclosed in D2 comprises a substrate 43. This is specifically described and referenced in relation to the embodiment of Figure 8 and 9 and implicit in the embodiment of Figures 10 and 11, see for example Figure 11 showing the substrate in which the printed conductor 45 is embedded.

It is therefore submitted that the skilled reader reading D2 would note that the heating means involves not only the resistive element of a wire heater element or a printed conductor but also the substrate 43 and indeed also the fragranced gel 44. There is no disclosure in D2 that the overall heating means including the substrate can be flexible. Rather, the overall teaching of D2 would lead the skilled person to conclude that the heating means was not flexible.

It is therefore submitted that claim 1 is novel over the teaching of document D2. In particular, it is pointed out that claim 1 requires that the heating means comprises a flexible thin film heater. It is the overall heater which is required to be thin and flexible and not just the resistive material of the heater. This is made clear on page 5 lines 9 to 13 of the description of the present application where it is stated that "the thin film heater comprises a laminate of three layers: an upper layer 21 of insulating material, a lower layer 23 of insulating material and an intermediate layer 22 of resistive material".

It is also submitted that claim 1 is inventive over document D2. As indicated above, D2 provides no teaching that the overall heating element as compared to the resistive material may be formed as a flexible thin film heater. The provision of heating means in the form of a flexible thin film heater has distinct advantages as clearly set out in the present description not least the advantage that the heater may be configured to fit in small volumes. The Examiner's attention is directed in particular to page 6 lines 19 to 21 of the present description which states that "an important advantage of using a thin film heater as described above is that the heater may be formed as a flexible element and does not require a rigid substrate". In D2 a substrate is disclosed as an essential element of the heater. There is therefore no reason for the skilled reader reviewing the teaching of D2 to amend the structure of the heater to arrive at the presently claimed apparatus.

In paragraph 2.2 of the Written Opinion the Examiner has objected to the novelty of claim 1 based on document D3. The Examiner contends that the passage on page 6 lines 6 to 12 is a disclosure of a flexible thin film heater. The Examiner is incorrect. Page 6 lines 6 to 12 of D3 merely discloses that the electrical element may be formed in a ring shape for example from a toroidally wound resistor wire or a PTC element; the heater may be encased in a plastics material. This is not a disclosure of a flexible thin film heater. Rather, the skilled reader would merely be directed by this teaching to form a toroidally wound heating element and nothing other than this. There is no motivation to amend the disclosed

structure to arrive at the claimed apparatus. It is therefore submitted that claim 1 is novel and inventive over the teaching of D3.

The Examiner has raised a number of objections to the dependent claims 2 to 29 based on documents D1 to D6. It is submitted that these objections are moot in light of the submissions made above in relation to the allowability of claim 1.

The Examiner is thanked for the remaining objections outlined in the Written Opinion. The applicant intends to deal with these in the regional/national phases of this application.

It is believed that it would now be appropriate to issue a clear International Preliminary Examination Report.

EPO Form 1037 is enclosed to enable you to acknowledge receipt.

Yours faithfully

John McKnight
Authorised Representative
Reckitt Benckiser plc

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the fragrance in the enclosed volume of the room.

Attempts have been made to provide an electrically heated vapour dispensing apparatus which operates from a portable power supply, such as batteries. However, such apparatus suffer from two main drawbacks. Firstly, they are under-powered such that they have difficulty in heating the fragrance or other volatile substance to the required temperature, as well as heating the volatile substance sufficiently rapidly. Secondly, batteries are not able to volatilise the fragrance for a long enough period to be acceptable to consumers. With many conventional apparatus the operating life of a battery power source would be only a matter of hours.

According to the present invention, there is provided an electrically heated apparatus for dispensing fragrancing materials and other volatile substances to an enclosed volume comprising a container containing a quantity of a volatile substance, heating means, transfer means for transferring said volatile substance towards said heating means and a portable power supply for energising said heating means, characterised in that said heating means comprises a flexible thin film heater. Other aspects of the present invention are defined in the attached claims.

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:-

Figure 1 is a schematic cross-sectional view through a first embodiment of electrically heated vapour dispensing apparatus according to the present invention;

Figure 2 is a schematic cross-sectional view through a second embodiment of electrically heated vapour dispensing apparatus according to the present invention;

1. An electrically heated apparatus for dispensing fragrancing materials and other volatile substances to an enclosed volume comprising a container containing a quantity of a volatile substance, heating means, transfer means for transferring said volatile substance towards said heating means and a portable power supply for energising said heating means, characterised in that said heating means comprises a flexible thin film heater.

2. Electrically heated apparatus as claimed in claim 1 wherein said thin film heater comprises a laminar of resistive material.

3. Electrically heated apparatus as claimed in claim 2 wherein the resistive material has positive temperature coefficient characteristics.

4. Electrically heated apparatus as claimed in any of claims 2 to 3 wherein the thin film heater comprises a laminate having at least one laminar of resistive material and at least one laminar of insulating material.

5. Electrically heated apparatus as claimed in claim 4 wherein the laminate comprises two insulating laminars attached to opposed surfaces of the resistive material laminar.

of claims 2 to 5 wherein the resistive material is a polymer thick film material or a polymer thin film material.

7. Electrically heated apparatus as claimed in any of claims 2 to 5 wherein the resistive material is formed at least partially from resistive ink.

8. Electrically heated apparatus as claimed in and of claims 2 to 5 or 7 wherein the resistive material is formed at least partially from resistive wire.

9. Electrically heated apparatus as claimed in claim 7 or claim 8 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 10 and 1000 microns.

10. Electrically heated apparatus as claimed in claim 7 or claim 8 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 10 and 100 microns.

11. Electrically heated apparatus as claimed in claim 7 or claim 8 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 20 and 50 microns.

maximising the efficient volatilisation and diffusion of the fragrance in the enclosed volume of the room.

Attempts have been made to provide an electrically heated vapour dispensing apparatus which operates from a portable power supply, such as batteries. However, such apparatus suffer from two main drawbacks. Firstly, they are under-powered such that they have difficulty in heating the fragrance or other volatile substance to the required temperature, as well as heating the volatile substance sufficiently rapidly. Secondly, batteries are not able to volatilise the fragrance for a long enough period to be acceptable to consumers. With many conventional apparatus the operating life of a battery power source would be only a matter of hours.

According to the present invention, there is provided an electrically heated apparatus for dispensing fragrancing materials and other volatile substances to an enclosed volume comprising a container containing a quantity of a volatile substance, heating means, transfer means for transferring said volatile substance towards said heating means and a portable power supply for energising said heating means, characterised in that said heating means comprises a flexible thin film heater.

Embodiments of the present invention will now be described, by way of example only, with reference to the accompanying drawings in which:-

Figure 1 is a schematic cross-sectional view through a first embodiment of electrically heated vapour dispensing apparatus according to the present invention;

Figure 2 is a schematic cross-sectional view through a second embodiment of electrically heated vapour dispensing apparatus according to the present invention;

Other aspects of the present invention are defined in the attached claims.

Claims:

1. An electrically heated apparatus for dispensing fragrancing materials and other volatile substances to an enclosed volume comprising a container containing a quantity of a volatile substance, heating means, transfer means for transferring said volatile substance towards said heating means and a portable power supply for energising said heating means; characterised in that said heating means comprises a flexible thin film heater.

2. Electrically heated apparatus as claimed in claim 1 wherein said thin film heater comprises a laminar of resistive material.

6 ~~5~~. Electrically heated apparatus as claimed in any of claims 2 [to 5] wherein the resistive material is a polymer thick film material or a polymer thin film material.

3 ~~4~~. Electrically heated apparatus as claimed in claim 2 ~~[or claim 3]~~ wherein the resistive material has positive temperature coefficient characteristics.

4 ~~5~~. Electrically heated apparatus as claimed in any of claims 2 to 3 ~~4~~ wherein the thin film heater comprises a laminate having at least one laminar of resistive material and at least one laminar of insulating material.

5 8. Electrically heated apparatus as claimed in claim 4 6 wherein the laminate comprises two insulating laminars attached to opposed surfaces of the resistive material laminar.

7. Electrically heated apparatus as claimed in any of claims 2 to 6 5 wherein the resistive material is formed at least partially from resistive ink.

8. Electrically heated apparatus as claimed in any of claims 2 to 7 5 or 7 wherein the resistive material is formed at least partially from resistive wire.

9. Electrically heated apparatus as claimed in claim 7 or claim 8 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 10 and 1000 microns.

10. Electrically heated apparatus as claimed in claim 7 or claim 8 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 10 and 100 microns.

11. Electrically heated apparatus as claimed in claim 7 or claim 8 wherein the laminar of resistive material is formed from one or more layers of resistive ink and/or resistive wire each layer having a thickness of between 20 and 50 microns.